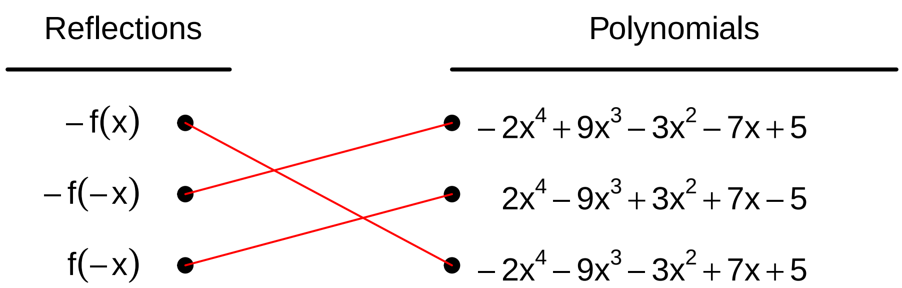
Name: Date:

Exam: Function Reflections (Solution version 34)

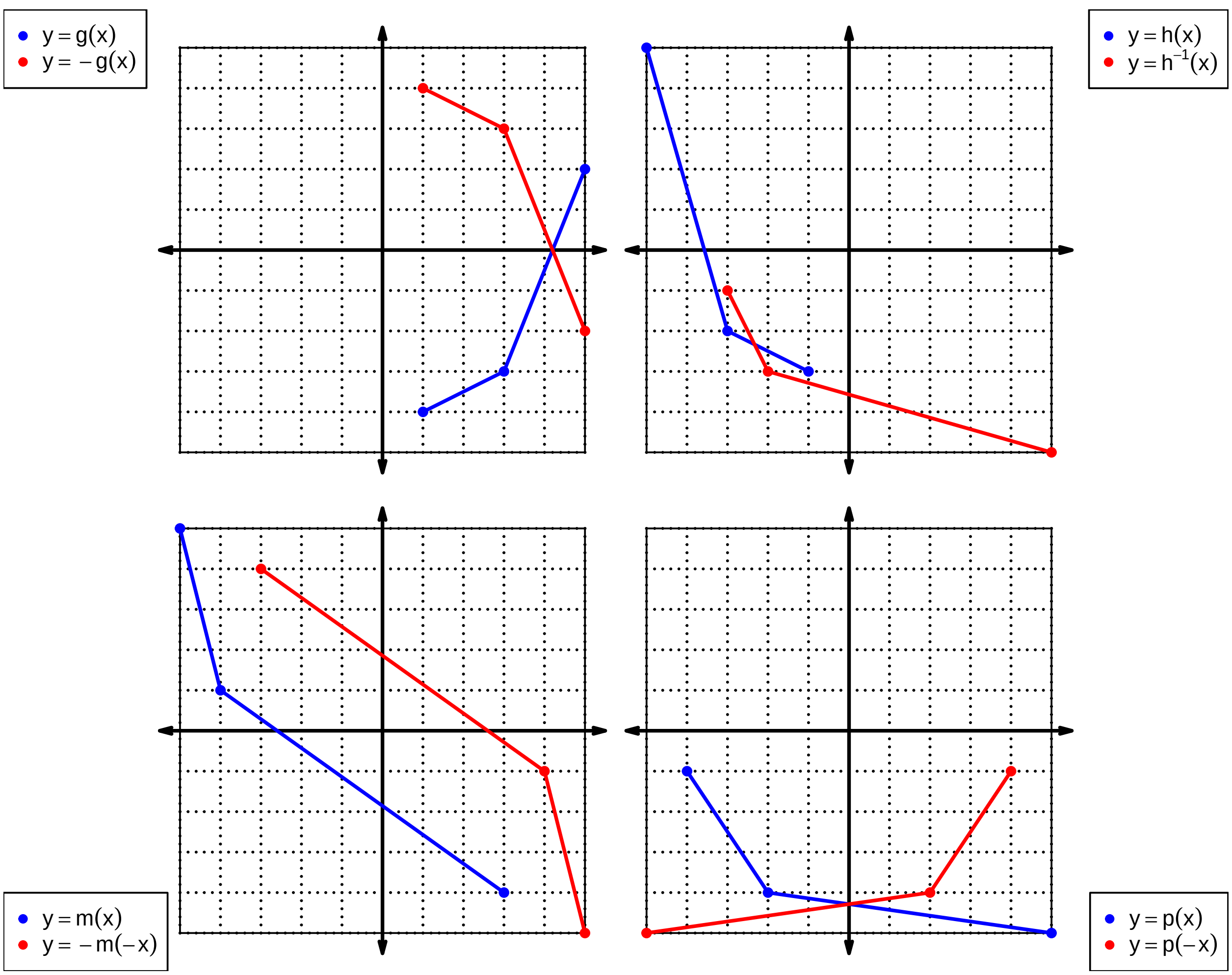
1. Let function f be defined by the polynomial below:

$$f(x) \;=\; 2x^4 + 9x^3 + 3x^2 - 7x - 5$$

Draw lines that match each function reflection with its polynomial:



2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	4	7	2
2	7	2	3
3	8	4	9
4	9	6	4
5	1	3	7
6	3	9	5
7	5	8	6
8	6	5	1
9	2	1	8

3. Evaluate $h(5)$.

$$h(5) = 7$$

4. Evaluate $f^{-1}(8)$.

$$f^{-1}(8) = 3$$

5. Assuming f is an **even** function, evaluate $f(-2)$.

If function f is even, then

$$f(-2) = 7$$

6. Assuming g is an **odd** function, evaluate $g(-1)$.

If function g is odd, then

$$g(-1) = -7$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

   $$p(x) \;=\; -x^3 - 1$$

   a. Express $p(-x)$ as a polynomial in standard form.

   $$p(-x) \;=\; -(-x)^3 - 1$$
   $$p(-x) \;=\; x^3 - 1$$

   b. Express $-p(-x)$ as a polynomial in standard form.

   $$-p(-x) \;=\; -\left(x^3 - 1\right)$$
   $$-p(-x) \;=\; -x^3 + 1$$

   c. Is polynomial p even, odd, or neither?

   neither

   d. Explain how you know the answer to part c.

   We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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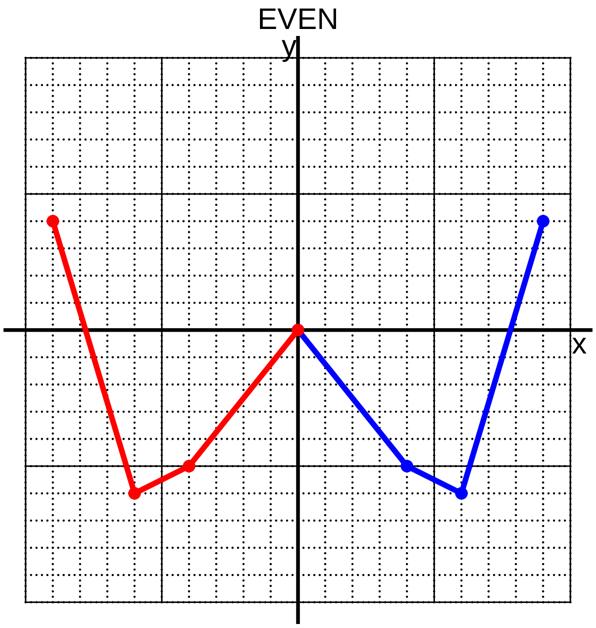
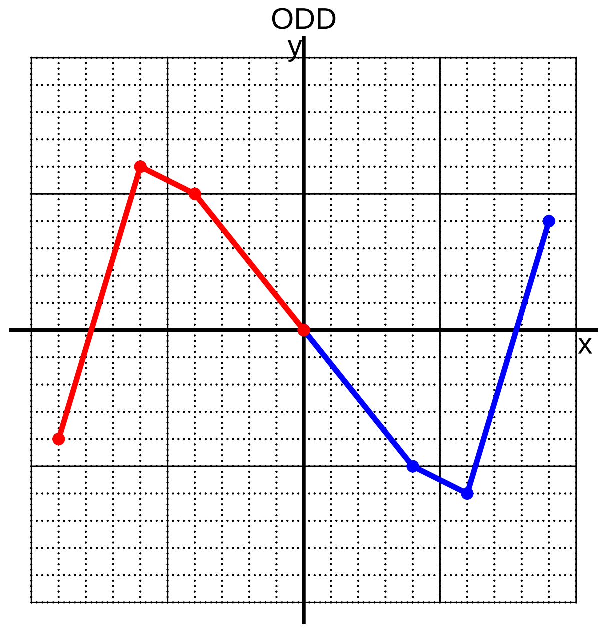
8. I have drawn half of a function. Draw the other half to make it even or odd.





9. Let function f be defined with the equation below.

$$f(x) = \frac{x-6}{7}$$

a. Evaluate $f(83)$.

step 1: subtract 6
step 2: divide by 7

$$f(83) = \frac{(83)-6}{7}$$
$$f(83) = 11$$

b. Evaluate $f^{-1}(13)$.

step 1: multiply by 7
step 2: add 6

$$f^{-1}(x) = 7x+6$$
$$f^{-1}(13) = 7(13)+6$$
$$f^{-1}(13) = 97$$

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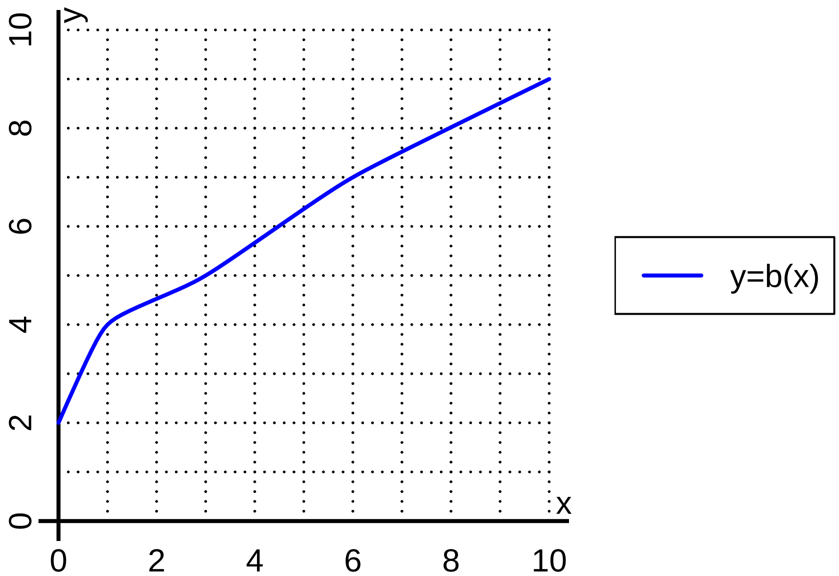
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(6)$.

$$b(6) \ = \ 7$$

b. Evaluate $b^{-1}(5)$.

$$b^{-1}(5) \ = \ 3$$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	3	-3	-3	3
-1	-6	6	6	-6
0	0	0	0	0
1	6	-6	-6	6
2	-3	3	3	-3

b. Is function f even, odd, or neither?

odd

c. How do you know the answer to part b?

Function f is odd because column $-f(-x)$ matches column $f(x)$ exactly.